

## The genus *Mecyclothorax* SHARP, 1903 in New Guinea

(Coleoptera, Carabidae, Psydrinae)\*

By Martin BAEHR

### Abstract

The New Guinean species of the genus *Mecyclothorax* SHARP, 1903 are reviewed and following six new species are described from a limited area in eastern central Irian Jaya: *M. eipomeki*, sp. n., *M. eliti*, sp. n., *M. jiwikae*, sp. n., *M. julianae*, sp. n., *M. langdae*, sp. n., and *M. sapei*, sp. n. Some preliminary ideas about the systematic grouping of the known species are presented.

### Introduction

*Mecyclothorax* is a genus of small ground beetles that is widely distributed in the Indopacific area from Java in the west through New Guinea, New Caledonia, Australia, New Zealand, to Hawaii and Tahiti in the east. The genus is notorious for its dispersal ability and for its extreme diversity it has achieved on certain islands or island groups like Hawaii and Tahiti, although the many species occurring there have probably evolved from one stock or few stocks each that have been introduced by rafting or by drifting by wind. In terms of species numbers the latter islands or island groups are certainly richest (BRITTON 1948, PERRAULT 1978, 1992), structural diversity of body morphology, however, is richest in Australia, where several rather distinct species groups occur (MOORE 1984). The origin of the genus may have been in the southeastern part of this continent where the most plesiomorphic species still exist, whereas the Australian species which managed to live in semiarid country, as well as those living in tropical rain forest in northern Queensland are presumably more apomorphic.

The most plesiomorphic Australian species, namely those related to *M. ambiguus* (ERICHSON) are still winged and the founder species in Hawaii, Tahiti, and also in New Guinea have been presumably winged, too, but today all species occurring on these islands or island groups are wingless. This is probably due to the mountain-living habits of all these species. The same is true for the highly evolved, montane species occurring in northern Queensland (MOORE 1984).

Although the species are said to live in ground litter (DARLINGTON 1962), some Australian species (e.g. *M. punctipennis* MACLEAY) are at least partly semi-arboricolous living on mossy tree trunks in subtropical and temperate rain forest, and several species from Tahiti have been also beaten from foliage of shrubs and ferns (PERRAULT 1992).

In the northwestern part of its areal the genus has been so far rather rare in terms of species. 5 species are known from Java (LOUWERENS 1949) and only 3 species were so far recorded from New Guinea, namely *M. toxopei* DARLINGTON, *M. sedlaceki* DARLINGTON, and *M. riedeli* BAEHR (DARLINGTON 1962, 1971, BAEHR 1992). Both DARLINGTON's species were recorded from very high mountain tops above 4200 m in the western and eastern parts of New Guinea, respectively, whereas *M. riedeli* was found in medium altitude (1900 m) in central eastern Irian Jaya.

Since description of the latter species A. RIEDEL collected several new species in a limited area in eastern central Irian Jaya that warrant a comprehensive account of the New Guinean *Mecyclothorax*.

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\* Results of the entomological explorations of A. RIEDEL in New Guinea in 1991, 1992, and 1993.

## Measurements

Measurements were made under a stereo microscope using an ocular micrometer. Length has been measured from tip of labrum to apex of elytra, hence, measurements may slightly differ from those of other authors.

## Deposition of types

The holotypes of the newly described species are either donated to the Zoologische Staatssammlung, München (ZSM), or are deposited as permanent loan in the collection of the author (ZSM-CBM). Paratypes are located in the collection of the author (CBM). The holotypes of DARLINGTON's species are located in the Natuurhistorisch Museum, Leiden (NHML) and the Bishop Museum, Honolulu (BMH).

## Characters

Main differentiating characters are shape and structure of the male genitalia (aedeagus, parameres, and genital ring), chetotaxy of pronotum and elytra, shape of pronotum and elytra, structure of microreticulation, and degree and structure of elytral striation.

### Key to the species of *Mecyclothorax* SHARP from New Guinea

1. 3th and 5th elytral striae with setiferous punctures. Wilhelmina Top, central Irian Jaya, at 4200 m ..... *toxopei* DARLINGTON  
– Only 3th elytral stria with setiferous punctures ..... 2.
2. Posterior lateral seta of pronotum present ..... 3.  
– Posterior lateral seta of pronotum absent ..... 5.
3. Elytra with 4 discal setae; elytral striae well impressed, crenulate, intervals convex, 7th stria fairly well developed; aedeagus see fig. 1. Juliana Top, eastern central Irian Jaya, at 3500 m .....  
..... *julianae*, sp. n.  
– Elytra with 2, rarely unilaterally 3 discal setae; elytral striae weakly impressed, outer striae consisting of rows of punctures only, intervals depressed, 7th stria scarcely indicated; aedeagus unknown ..... 4.
4. Smaller, shorter species, length c. 4.3 mm; colour black; pronotum wider, ratio  $w/l$  c. 1.36, lateral margin very shortly sinuate in front of the subdentiform basal angles; surface of elytra irregularly microreticulate. Mt. Wilhelm, central Papua New Guinea, at 4250 m ..... *sedlaceki* DARLINGTON  
– Larger, longer species, length c. 5.5 mm; colour reddish-piceous; pronotum narrower, ratio  $w/l$  <1.20, lateral margin barely sinuate in front of the obtusely subdentiform basal angles; surface of elytra regularly microreticulate. Eipomek-Langda area, eastern central Irian Jaya, at 3500 m .....  
..... *eipomeki*, sp. n.
5. Larger species, length >5.2 mm; base of pronotum distinctly punctate, basal angles almost rectangular, lateral margin near base distinctly sinuate; aedeagus see figs 5, 7 ..... 6.  
– Smaller species, length <4.6 mm; base of pronotum impunctate, basal angles obtuse, lateral margin near base not or barely sinuate; aedeagus see figs 10, 11 and BAEHR (1992) ..... 7.
6. Larger species, length >5.7 mm; microreticulation on head and pronotum barely indicated, on elytra rather superficial, but present on apical part of elytra; basal angles of pronotum obtuse at apex, lateral margins distinct, explanate and slightly upturned; at least median elytral striae deeply impressed, intervals distinctly convex; aedeagus see fig. 5. Gunung Elit, eastern central Irian Jaya, at 3200-3300 m .....  
..... *cliti*, sp. n.

- Smaller species, length c. 5.3 mm; microreticulation distinct, on elytra even very conspicuous, but absent on apical part of elytra; basal angles of pronotum rectangular, lateral margins very narrow, barely explanate and upturned; elytral striae barely impressed, intervals depressed; aedeagus see fig. 7. Sape Valley, north of Juliana Top, eastern central Irian Jaya, at 3400 m ..... *sapei*, sp. n.
- 7. Smaller and shorter species, length <3.8 mm, ratio l/w of elytra <1.37; lateral margin of pronotum narrow, barely widened at basal angles, angles almost rounded off; anterior transverse sulcus of pronotum weak; aedeagus fig. 10. Jiwika area, central Irian Jaya, at 2300 m ..... *jiwika*, sp. n.
- Larger and more elongate species, length >4.0 mm, ratio l/w of elytra >1.42; lateral margin of pronotum wider, always distinctly widened at basal angles, angles distinct, though obtuse; anterior transverse sulcus of pronotum distinct; aedeagus see fig. 11, or markedly curved with slightly upturned apex and two sclerotized rods within internal sac (see BAEHR 1992) ..... 8.
- 8. Smaller and shorter species, length <4.4 mm, ratio l/w of elytra 1.42-1.44; colour glossy black; lateral margin of pronotum wider; striae of elytra less impressed, intervals less convex; median segments of antenna shorter, c. 2 × as long as wide; aedeagus markedly curved with slightly upturned apex and two sclerotized rods within internal sac (see BAEHR 1992). Kangine area, Baliem Valley, central Irian Jaya, at 1900 m ..... *riedeli* BAEHR
- Larger and more elongate species, length 4.6 mm, ratio l/w of elytra 1.52; colour reddish, with slightly darker head; lateral margin of pronotum narrower; striae of elytra more deeply impressed, intervals distinctly convex; median segments of antenna longer, c. 2.5 × as long as wide; aedeagus fig. 11. Langda area, eastern central Irian Jaya, at 2300 m ..... *langdae*, sp. n.

### The species

#### *Mecyclothorax toxopei* DARLINGTON

Fig. 21

*Mecyclothorax toxopei* DARLINGTON, 1962, p. 506; 1971, p. 266; BAEHR 1992, p. 249.

Types. Holotype (not seen): ♂, Wilhelminatop, Scree Valley Camp, 4200 m, Sept. 23, 1938, L. J. TOXOPEUS (NHML).

Diagnosis. Rather small, black species, immediately distinguished by the large number of setiferous punctures on elytra, namely 5-6 on 3rd interval and 3-4 on 5th interval which is unique in any species known from New Guinea.

Distribution (Fig. 21). Wilhelmina Top, at 4200 m, central Irian Jaya. Known only from type locality.

Notes. No further records about collecting circumstances known. The holotype seems to be unique. Different from most other New Guinean species *M. toxopei* is truly alpine and lives above the tree line.

#### *Mecyclothorax sedlaceki* DARLINGTON

Fig. 22

*Mecyclothorax sedlaceki* DARLINGTON, 1971, p. 265; BAEHR 1992, p. 249.

Types. Holotype: ♀, Mt. Wilhelm, Bismarck Rge., 4250 m, June 3, 1963, J. SEDLACEK (BMH).

Diagnosis. Rather small, black species, distinguished by the presence of the posterior lateral seta of pronotum, presence of 2-3 discal elytral setae only, rather wide pronotum, and weak microreticulation of the elytra.

Distribution (Fig. 22). Mt. Wilhelm, at 4250 m, central Papua New Guinea. Known only from type locality.

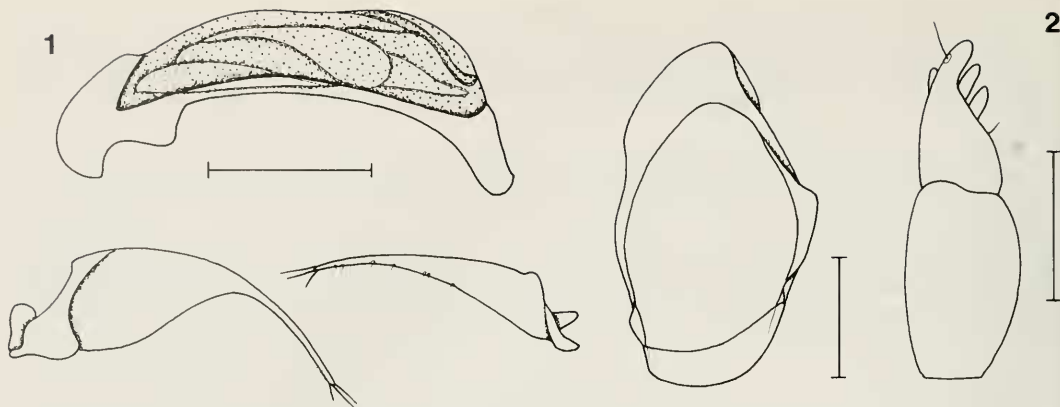


Fig. 1. *Mecyclothorax julianae*, sp. n. Aedeagus, parameres, and genital ring. Scales: 0.5 mm.

Fig. 2. *Mecyclothorax eipomeki*, sp. n. ♀ stylomeres 1 and 2. Scale: 0.1 mm.

Notes. No further records about collecting circumstances known. The holotype seems to be unique. Different from most other New Guinean species *M. sedlaceki* is truly alpine and lives above the tree line.

*Mecyclothorax riedeli* BAEHR

Figs 18, 21

*Mecyclothorax riedeli* BAEHR, 1992, p. 250.

Types. Holotype: ♂, Irian Jaya, Baliem-Distr., Kangime, 1900 m, 4.9.1990, leg. A. RIEDEL (ZSM). - Paratype: ♀, same data (CBM).

Diagnosis. Rather small, black species, distinguished by absence of the posterior lateral seta of pronotum, obtuse basal angle of pronotum without distinct sinuosity, distinctly widened lateral margin of pronotum at base, rather short elytra with little impressed striae (Fig. 18), and distinctly iridescent surface. It is closely related to *M. jiwikae*, sp. n. and *M. langdae*, sp. n., but distinguished from both species by wider base of pronotum with better marked basal angles, further from *M. jiwikae* by larger size and longer elytra, and from *M. langdae* by lesser size and shorter elytra.

Distribution (Fig. 21). Baliem district, central Irian Jaya, at 1900 m. Known only from type locality.

Notes. No new records available. The species was collected under logs or in leaf litter in wet montane rain forest. This is a true rain forest species that occurs in median altitude.

*Mecyclothorax julianae*, sp. n.

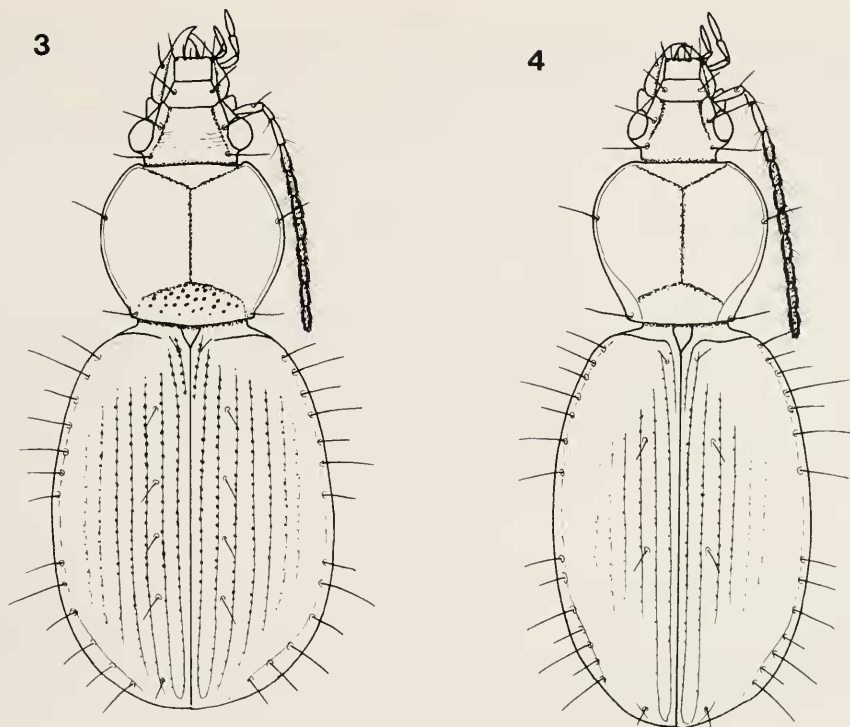
Figs 1, 3, 14, 21

Types. Holotype: ♂, IRIAN JAYA, Jayawijaya-Prov., Upper Yem Yem Valley NW Mt. Juliana, 3500 m, 19.IX.1993, leg. A. RIEDEL (ZSM-CBM).

Diagnosis. Rather small, dark piceous species, distinguished by presence of the posterior lateral seta of pronotum, almost rectangular basal angle of pronotum, very coarsely punctate basal part of pronotum, fairly elongate elytra with deeply impressed and markedly crenulate striae, and glossy surface.

**Description:**

Measurements. Length: 4.6 mm; width: 1.9 mm; Ratios. Width head/prothorax: 0.69; width/length



Figs 3, 4. Habitus. 3. *Mecyclothorax julianae*, sp. n. 4. *M. eipomeki*, sp. n. Lengths: 4.6 mm; 5.5 mm.

of prothorax: 1.25; width base/apex of prothorax: 1.11; width elytra/prothorax: 1.42; length/width of elytra: 1.47.

Colour. Dark piceous, mouth parts reddish-piceous, antenna piceous, four basal antennomeres reddish, legs dark reddish. Lower surface piceous, epipleurae and lateral margins of apical abdominal sterna dirty reddish.

Head (Fig. 3). Rather narrow in relation to prothorax. Eyes large, orbits short, almost perpendicular, c.  $\frac{1}{6}$  of length of eye. Clypeal suture well impressed. Frontal furrows slightly sinuate, oblique, deep, surpassing anterior supraorbital seta. Labrum transverse, truncate, 6-setose. Mandibles rather short and wide, at apex suddenly curved. Mentum with distinct, apically rounded tooth. Antenna moderately elongate, slightly surpassing posterior border of pronotum. Posterior supraorbital seta situated slightly in front of orbit. Frons with several faint transverse striae, almost impunctate, microreticulation very superficial, largely absent, surface highly glossy.

Pronotum (Fig. 3). Large, wide, in middle markedly convex, laterally evenly curved, shortly excised in front of the almost rectangular posterior angles. Widest diameter in middle. Base evidently wider than apex. Apex faintly convex, apical angles slightly projecting, rounded off. Base slightly convex. Marginal channel rather deep and wide throughout, slightly explanate just in front of basal angles. Disk with a very deep, v-shaped anterior sulcus attaining anterior angles. Median line shallow, meeting anterior sulcus, posteriorly abbreviated. Basal grooves about circular. Whole basal third separated from disk by a sulcus, explanate, less convex than disk, with sparse and very coarse punctures. Both, apex and base not bordered. Anterior marginal seta situated well in front of middle, posterior marginal seta situated slightly in front of basal angles. Surface almost impunctate, microreticulation very superficial, in parts absent, consisting of extremely fine transverse lines. Only on basal explanation microreticulation more distinct, less transverse. Surface highly glossy.

Elytra (Figs 3, 14). Fairly elongate, convex, oviform, widest diameter slightly behind middle. Shoulders widely rounded off, lateral margin evenly curved. Basal margin strong, transverse, almost straight, connected to scutellary striae. All striae distinct and impressed, though abbreviated at shoulder except for

sutural stria, 5 inner striae deeply impressed, distinctly crenulate, 6th striae less impressed, though likewise crenulate, 7th stria inconspicuous, only punctate. Scutellary striole elongate, situated within 1st interval. Marginal channel deep and wide. 3rd interval with 4 setiferous punctures in centre of interval, punctures large and deep. Near apex unilaterally with a setiferous puncture close to inner margin of 3rd stria. Marginal pores large and conspicuous. Intervals impunctate, microreticulation distinct, though somewhat superficial, consisting of irregular, transverse meshes and lines. Surface moderately glossy. Inner wings absent.

Lower surface. Impunctate. Metepisternum slightly longer than wide. Sternum VII in male 2-setose.

Legs. Without striking features. Three basal tarsomeres of male anterior tarsus expanded and squamose.

♂ genitalia (Fig. 1). Genital ring massive, strongly sclerotized, ovalish, apex wide, lateral part on right side markedly protruding. Aedeagus moderately elongate, slightly curved, apex slightly twisted, strongly compressed, with a minute denticle on upper side. Apex slightly, orifice markedly turned to right. Internal sac with a strongly sclerotized fold. Both parameres elongate, though basally rather wide. Right paramere at apex with two elongate apical setae and a shorter subapical seta, and with few thin and rather elongate hairs along lower margin. Left paramere basally wide, with narrow, elongate, markedly curved apex that bears two longer apical setae, a shorter subapical seta, and some minute hairs at lower margin.

♀ genitalia. Unknown

Variation. Unknown.

Distribution (Fig. 21). Mt. Juliana, eastern central Irian Jaya, at 3500 m. Known only from type locality.

Habits. Presumably collected in alpine grassland on the ground by sieving grass roots or litter. This is a ground-living species of high altitudes.

Etymology. The name refers to the type locality, Mt. Juliana.

*Mecyclothorax eipomeki*, sp. n.

Figs 2, 4, 15, 21

Types. Holotype: ♀, Irian Jaya, Jayawijaya-Pr., Eipomek-Langda, 3500 m, 23.-24.8.1992, leg. A. RIEDEL (ZSM-CBM).

Diagnosis. Rather large, reddish-piceous species, distinguished by presence of the posterior lateral seta of pronotum, almost rectangular, though obtuse basal angle of pronotum, impunctate base of pronotum, elongate, not oviform elytra with moderately impressed inner striae, and markedly dull, conspicuously microreticulate surface.

**Description:**

Measurements. Length: 5.5 mm; width: 2.2 mm; Ratios. Width head/prothorax: 0.69; width/length of prothorax: 1.18; width base/apex of prothorax: 1.06; width elytra/prothorax: 1.38; length/width of elytra: 1.49.

Colour. Dull reddish-piceous, palpi, antennae, and legs reddish. Lower surface piceous, epipleurae and lateral margins of apical abdominal sterna reddish.

Head (Fig. 4). Rather narrow in relation to prothorax. Eyes rather large, orbits moderately short, oblique, c.  $\frac{1}{4}$  of length of eye. Clypeal suture well impressed. Frontal furrows slightly sinuate, oblique, deep, surpassing anterior supraocular seta. Labrum transverse, truncate, 6-setose. Mandibles short and wide, apically gently curved. Mentum with distinct, apically rounded tooth. Antenna rather elongate, surpassing posterior border of pronotum by c. 1.5 antennomeres. Posterior supraorbital seta situated slightly in front of posterior limit of orbit. Frons with some very faint transverse striae, almost impunctate, microreticulation on frons rather superficial, transverse, on summit distinct, almost isodiametric, surface rather dull.

Pronotum (Fig. 4). Large, wide, in middle rather depressed, laterally evenly curved in anterior part, moderately curved posteriorly, shortly excised in front of the almost rectangular though markedly obtuse basal angles. Widest diameter in middle. Base barely wider than apex. Apex straight, apical angles barely projecting, rounded off. Base convex, laterally rather oblique. Marginal channel moderately wide, rather

shallow, markedly explanate in front of basal angles. Disk with a fairly deep, v-shaped anterior sulcus attaining anterior angles. Median line shallow, meeting anterior sulcus, posteriorly abbreviated. Basal grooves large, oblong, rather deep. Whole basal third separated from disk by a sulcus, slightly explanate, slightly less convex than disk, impunctate, though with some irregular, superficial longitudinal striae. Apex weakly bordered, base not bordered. Anterior marginal seta situated slightly in front of middle, posterior marginal seta situated just in front of basal angles. Surface impunctate, microreticulation distinct, though rather superficial, consisting of fine, transverse meshes, fairly dull.

Elytra (Figs 4, 15). Rather narrow and elongate, highly convex, widest diameter about in middle. Shoulders rounded off, lateral margin evenly curved. Basal margin strong, almost transverse, slightly sinuate, connected to scutellary striole. All striae except for sutural stria much abbreviated at shoulder and apex. 4 internal striae moderately impressed, finely punctate, 5th and 6th striae inconspicuous, not impressed, 7th striae barely perceptible. Scutellary striole elongate, situated within 1st interval. Marginal channel moderately deep and rather wide. 3rd interval with 2 setiferous punctures in centre of interval, anterior puncture behind basal fourth, posterior puncture behind middle, punctures rather inconspicuous. Near apex with a setiferous puncture in an elongate groove at position of 3rd stria. Marginal pores rather large and conspicuous. Intervals impunctate, microreticulation very distinct, about isodiametric. Surface dull. Inner wings absent.

Lower surface. Impunctate. Metepisternum slightly longer than wide. Sternum VII in female 4-setose.

Legs. Without striking features. Vestiture of male anterior tarsus unknown.

♂ genitalia. Unknown.

♀ genitalia (Fig. 2). Stylomere 2 with short, curved apex, with 2 short and thick ventral ensiform setae and a short bristle below, a dorsal ensiform seta, and a nematiform seta originating from a small pit. Apex of stylomere 1 apparently a-setose.

Variation. Unknown.

Distribution (Fig. 21). The Eipomek-Langda area in eastern central Irian Jaya at 3500 m. Known only from type locality.

Habits. Presumably collected in alpine grassland on the ground by sieving grass roots or litter. This is a ground-living species of high altitudes.

Etymology. The name refers to the type locality, the Eipomek area.

### *Mecyclothorax eliti*, sp. n.

Figs 5, 6, 8, 16, 21

Types. Holotype: ♂ (immat), Irian Jaya, Jayawijaya-Pr., Wamena, 3300 m, w. Gn. Elit, 15.9.1991, leg. A. RIEDEL (ZSM). - Paratypes: 1♂ (immat.), 2♀♀, IRIAN JAYA, Jayawijaya-Prov., E. Wamena, Gn. Elit, Siam, 3200 m, 12.-13.X.1993 (CBM).

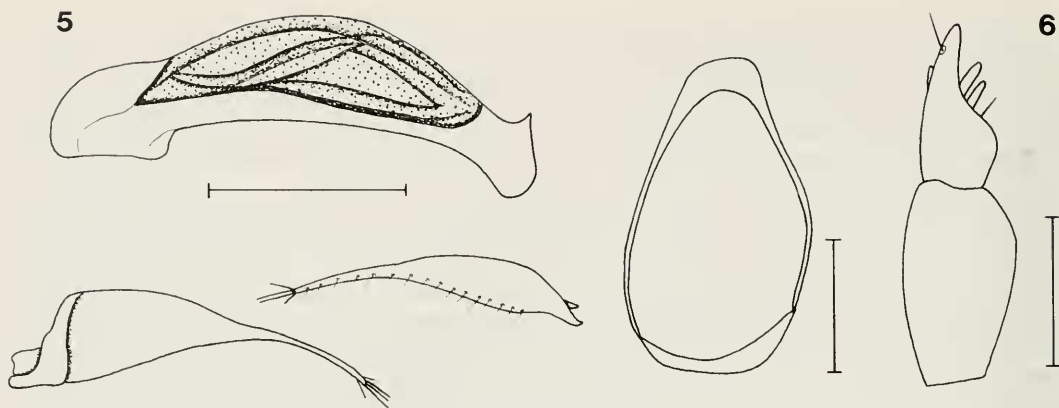
Diagnosis. Rather large, bicoloured species, distinguished by absence of the posterior lateral seta of pronotum, almost rectangular, though obtuse basal angle of pronotum, coarsely punctate basal part of pronotum, moderately elongate, oviform elytra with deeply impressed inner striae, and fairly glossy surface.

#### **Description:**

Measurements. Length: 5.8-6.3 mm; width: 2.35-2.60 mm; Ratios. Width head/prothorax: 0.65-0.69; width/length of prothorax: 1.15-1.19; width base/apex of prothorax: 1.09-1.12; width elytra/prothorax: 1.38-1.40; length/width of elytra: 1.42-1.45.

Colour. Head and pronotum black, elytra dark reddish-piceous, lateral margins of pronotum and elytra reddish translucent. Mandibles, palpi, and antennae reddish, legs reddish-piceous. Lower surface black, elytral epipleurae contrastingly light reddish, margins of apical abdominal sternum reddish-piceous.

Head (Fig. 8). Rather narrow in relation to prothorax. Eyes moderately large, though markedly protruding, orbits moderately short, oblique, slightly  $> \frac{1}{4}$  of length of eye. Clypeal suture well impressed.



Figs 5, 6. *Mecyclothorax eliti*, sp. n. ♂ and ♀ genitalia. 5. Aedeagus, parameres, and genital ring. Scales: 0.5 mm. 6. ♀ stylomeres 1 and 2. Scale: 0.1 mm.

Frontal furrows slightly sinuate, oblique, deep, just surpassing anterior supraocular seta. Labrum transverse, truncate, 6-setose. Mandibles rather short and wide, apically suddenly curved. Mentum with distinct, apically rounded tooth. Antenna rather elongate, surpassing posterior border of pronotum by c. 2 antennomeres. Posterior supraorbital seta situated at posterior border of eye. Surface with some very faint transverse strioles on frons, in holotype frons with a shallow groove on either side. Behind frons with a large, shallow, transverse sulcus across head. Frons extremely sparsely and minutely punctate, with very superficial microreticulation of transverse meshes and lines that is in parts absent. Microreticulation on summit distinct, almost isodiametric, surface glossy.

Pronotum (Fig. 8). Large, wide, in middle rather convex, laterally laterally evenly curved, with rather elongate excision in front of the almost rectangular though at apex rounded basal angles. Widest diameter in middle. Base evidently wider than apex. Apex straight, apical angles slightly projecting, rounded off. Base almost straight, laterally slightly oblique. Marginal channel moderately wide, rather deep, narrowest in apical third, slightly widened towards apical angles, gradually widened posteriorly, markedly explanate in front of basal angles. Disk with a superficial, inconspicuous, v-shaped anterior sulcus attaining anterior angles. Median line extremely shallow, meeting anterior sulcus, posteriorly abbreviated. Basal grooves large, oblong, rather deep. Whole basal third separated from disk by a transverse sulcus, slightly explanate, slightly less convex than disk, rather coarsely punctate. Apex weakly bordered, base not bordered. Anterior marginal seta situated about in middle, slightly removed from lateral margin, posterior marginal seta absent. Surface almost impunctate, microreticulation on disk extremely superficial, mostly absent, more distinct at apex and in basal explanate area, there rather isodiametric. Surface glossy.

Elytra (Figs 8, 16). Rather wide and short, highly convex, oviform, widest diameter behind middle. Shoulders obtusely rounded off, lateral margin evenly curved. Basal margin strong, almost transverse, slightly sinuate, connected to scutellary striole. Striae except for sutural stria much abbreviated at shoulder, outer striae also abbreviated at apex. 5 internal striae deeply impressed, somewhat crenulate, 6th stria barely impressed, punctate, 7th striae barely perceptible. Scutellary striole elongate, situated within 1st interval. Marginal channel moderately deep and rather wide. 3rd interval with 2 setiferous punctures in centre of interval, anterior puncture in basal fourth, posterior puncture at middle, punctures fairly deep and conspicuous. Near apex with a setiferous puncture outside 3rd stria within a deep striole marking the prolongation of 7th stria. Marginal pores rather large and conspicuous. Intervals impunctate, microreticulation fairly distinct, though slightly superficial, about isodiametric. Surface rather glossy. Inner wings absent.

Lower surface. Impunctate. Metepisternum slightly longer than wide. Sternum VII in male 2-setose, in female 4-setose.

Legs. Without striking features. Three basal tarsomeres of male anterior tarsus expanded and squamose.

♂ genitalia (Fig. 5). Genital ring in the immature holotype weakly sclerotized, ovalish, laterally convex. Aedeagus elongate, rather straight, apex slightly twisted, widely explanate, foliaceous, extremely thin, with a sharp upturned hook, apex and orifice somewhat turned to right. Internal sac apparently without



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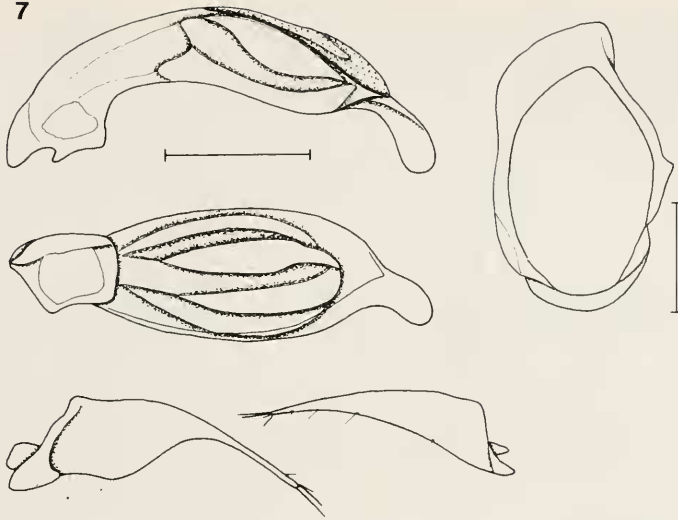


Fig. 7. *Mecyclothorax sapei*, sp. n. Aedeagus lateral and ventral view, parameres, and genital ring. Scales: 0.5 mm.

markedly sclerotized parts, but with some folding. Both parameres very elongate, rather narrow. Right paramere at apex with two elongate apical setae and some shorter subapical setae, and with several thin and rather elongate hairs along lower margin. Left paramere basally moderately wide, with narrow, elongate apex that bears three longer apical and two shorter subapical setae.

♀ genitalia (Fig. 6). Stylomere 2 with rather elongate, straight apex, with 2 moderately elongate ventral ensiform setae and a short bristle below, a dorsal ensiform seta, and a nematiform seta originating from a small pit. Apex of stylomere 1 apparently aetose.

Variation. Little variation noted apart from minor differences of distinctness of microreticulation, and absence of the shallow frontal grooves of the holotype in the three paratypes.

Distribution (Fig. 21). Gunung Elit, central Irian Jaya, at 3200-3300 m. Known only from that mountain.

Habits. Presumably collected in alpine grassland on the ground by sieving grass roots or litter. This is a ground-living species of high altitudes.

Etymology. The name refers to the type locality, the Gunung Elit.

*Mecyclothorax sapei*, sp. n.

Figs 7, 9, 17, 27

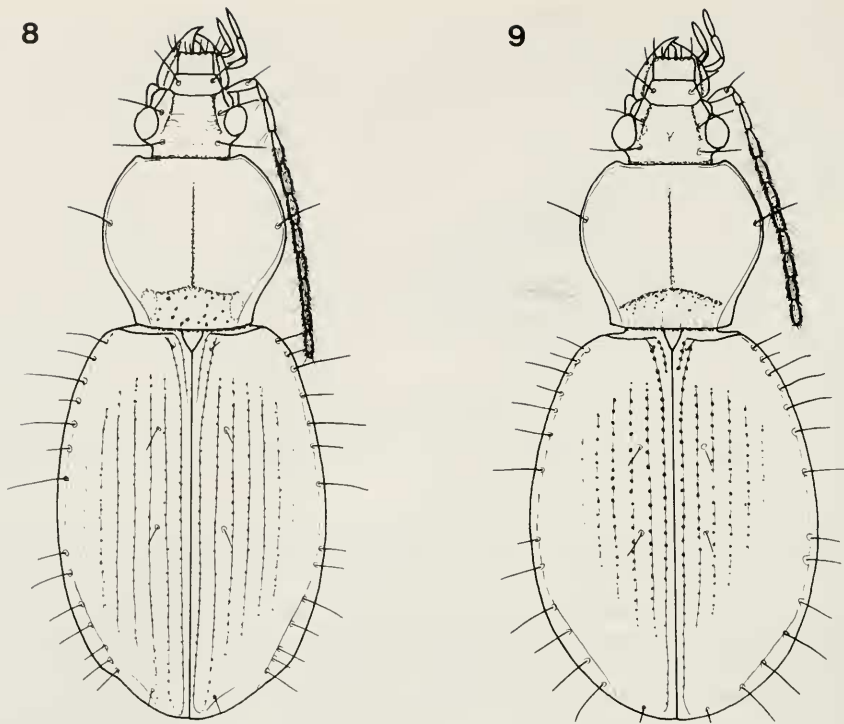
Types. Holotype: ♂, IRIAN JAYA, Jayawijaya-Prov., Upper Sape (Digul) Valley, N. Mt. Juliana, 3400 m, 16.-17.IX.1993, leg. A. RIEDEL (ZSM-CBM).

Diagnosis. Rather large, dull black species, distinguished by absence of the posterior lateral seta of pronotum, almost rectangular, though obtuse basal angle of pronotum, coarse though diffuse puncturation of basal part of pronotum, rather short, oviform elytra with slightly impressed, coarsely punctate inner striae, and dull surface except for the markedly glossy apex of the elytra.

**Description:**

Measurements. Length: 5.25 mm; width: 2.25 mm; Ratios. Width head/prothorax: 0.75; width/length of prothorax: 1.13; width base/apex of prothorax: 0.96; width elytra/prothorax: 1.50; length/width of elytra: 1.39.

Colour. Dull black, lateral margin of elytra posteriorly reddish translucent. Mandibles, palpi, and



Figs 8, 9. Habitus. 8. *M. eliti*, sp. n. 9. *Mecyclothorax sapei*, sp. n. Lengths: 6.3 mm; 5.25 mm.

antennae reddish-piceous, legs piceous-black, though anterior and posterior surfaces of femora and parts of tarsi reddish. Lower surface black, elytral epipleurae contrastingly reddish, posterior margins of apical abdominal sterna reddish-piceous.

Head (Fig. 9). Rather wide in relation to prothorax. Eyes moderately large, rather protruding, orbits moderately short, oblique, slightly  $> \frac{1}{4}$  of length of eye. Clypeal suture lightly impressed. Frontal furrows slightly sinuate, oblique, deep, just surpassing anterior supraocular seta. Labrum transverse, truncate, 6-setose. Mandibles rather short and wide, apically suddenly curved. Mentum with distinct, apically rounded tooth. Antenna moderately elongate, surpassing posterior border of pronotum by about one antennomere. Posterior supraorbital seta situated at posterior border of eye. Anterior part of frons medially of frontal furrow rather uneven, posteriorly with a shallow groove adjacent to end of furrow. Surface apparently impunctate, with distinct, almost isodiametric microreticulation that is somewhat superficial only in middle of frons, surface rather dull.

Pronotum (Fig. 9). Large, wide, in middle moderately depressed, laterally evenly curved, with rather elongate excision in front of the almost rectangular basal angles. Widest diameter in front of middle. Base evidently narrower than apex. Apex straight, apical angles barely projecting, rounded off. Base almost straight, laterally slightly oblique. Marginal channel narrow, rather shallow, posteriorly barely widened, slightly explanate only just in front of basal angles. V-shaped anterior sulcus not perceptible. Median line extremely shallow, anteriorly and posteriorly abbreviated. Basal grooves large, oblong, moderately deep. Whole basal third separated from frons by a transverse sulcus, slightly explanate, slightly less convex than disk, rather coarsely though vaguely punctate. Both, apex and base not bordered. Anterior marginal seta situated well in front of middle at lateral margin, posterior marginal seta absent. Surface almost impunctate, microreticulation on disk distinct, though fine and somewhat superficial, slightly transverse, slightly more distinct in basal explanate area, there almost isodiametric. Surface rather dull.

Elytra (Figs 9, 17). Rather wide and short, convex, oviform, widest diameter slightly behind middle. Shoulders obtusely rounded off, lateral margin evenly curved. Basal margin strong, almost transverse, slightly sinuate, connected to scutellary striole. Striae except sutural stria much abbreviated at shoulder

and apex. 3 internal striae slightly impressed, coarsely punctate, 4th and 5th striae not impressed, though still distinct, developed as rows of coarse punctures, 6th and 7th striae barely perceptible. Scutellary striole elongate, situated within 1st interval. Marginal channel moderately deep, rather narrow. 3rd interval with 2 setiferous punctures in centre of interval, anterior puncture in basal fourth, posterior puncture at middle, punctures fairly inconspicuous. Very close to apex with a setiferous puncture at position of 3rd stria. Marginal pores moderately conspicuous. Intervals impunctate, microreticulation distinct, about isodiametric, but apex without microreticulation. Surface dull, at apex glossy. Inner wings absent.

Lower surface. Impunctate. Metepisternum about quadrate. Sternum VII in male 2-setose.

Legs. Without striking features. Three basal tarsomeres of male anterior tarsus expanded and squamose.

♂ genitalia (Fig. 7). Genital ring massive, strongly sclerotized, ovalish, apex wide, lateral part on right side markedly protruding. Aedeagus moderately elongate, wide, slightly curved, lower surface markedly convex, deeply sinuate in front of apex, apex markedly twisted, explanate, spoon-shaped. Apex slightly, orifice considerably turned to right. Internal sac with a large, heavily sclerotized fold. Both parameres elongate, though basally rather wide. Right paramere at apex with two elongate apical setae and a shorter subapical seta, and with few thin and rather elongate hairs along lower margin. Left paramere basally wide, with narrow, elongate, moderately curved apex that bears two longer apical setae, a shorter subapical seta, and a minute hair at upper border.

♀ genitalia. Unknown.

Variation. Unknown.

Distribution (Fig. 21). Eastern Central Irian Jaya. Known only from type locality.

Habits. Presumably collected in alpine grassland on the ground by sieving grass roots or litter. This is a ground-living species of high altitudes.

Etymology. The name refers to the type locality, the Sape Valley.

### *Mecyclothorax jiwikae*, sp. n.

Figs 10, 12, 19, 21

Types. Holotype: ♂, Irian Jaya, Jayawijaya-Pr., Wamena, Jiwika, 2300 m, 29.9.1992, leg. A. RIEDEL (ZSM). - Paratype: 1♂, same data (CBM).

Diagnosis. Small, iridescent black species, distinguished by absence of the posterior lateral seta, barely perceptible, almost completely rounded off basal angle, and impunctate basal part of pronotum, short, not oviform elytra with shallow inner striae, and fairly glossy, iridescent surface. It is closely related to *M. riedeli* BAEHR and *M. langdae*, sp. n., but is distinguished from both species by lesser size, shorter and wider elytra, even less marked basal angles of pronotum, and very weak anterior transverse sulcus of pronotum.

#### Description:

Measurements. Length: 3.50-3.75 mm; width: 1.60-1.65 mm; Ratios. Width head/prothorax: 0.64-0.66; width/length of prothorax: 1.18-1.20; width base/apex of prothorax: 0.95-0.98; width elytra/prothorax: 1.42-1.43; length/width of elytra: 1.37.

Colour. Black, mandibles, palpi, and antennae reddish, 4th and 5th antennomeres in part piceous, legs reddish. Lower surface black, elytral epipleurae piceous.

Head (Fig. 12). Rather narrow in relation to prothorax. Eyes rather small, depressed, orbits large, oblique, c.  $\frac{1}{3}$  of length of eye. Clypeal suture well impressed. Frontal furrows slightly sinuate, very oblique, deep, prolonged just medially of eyes almost behind posterior supraocular seta. Labrum transverse, truncate, 6-setose. Mandibles moderately elongate, apically suddenly curved. Mentum with distinct, apically rounded tooth. Antenna rather elongate, surpassing posterior border of pronotum by c. 2 antennomeres. Posterior supraorbital seta situated well behind posterior border of eye. Frons with shallow, elongate median groove. Surface impunctate, with rather superficial microreticulation of moderately transverse meshes, surface glossy.

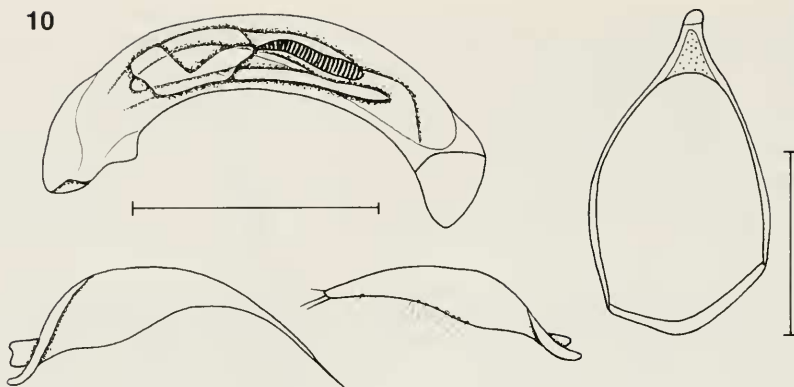


Fig. 10. *Mecyclothorax jiwikae*, sp. n. Aedeagus, parameres, and genital ring. Scales: 0.5 mm.

Pronotum (Fig. 12). Large, wide, circular, in middle rather depressed, laterally evenly curved, without any excision in front of the almost rounded off, barely receptive basal angles. Widest diameter far in front of middle. Base slightly narrower than apex. Apex straight, apical angles feebly projecting, rounded off. Base almost straight, laterally very oblique. Marginal channel narrow throughout, barely widened near basal angles. V-shaped anterior sulcus only laterally perceptible. Median line distinctly impressed, anteriorly slightly, posteriorly much abbreviated. Basal grooves linear, elongate, straight. Basal area not explanate, on same level with disk, almost impunctate. Both, apex and base not bordered. Anterior marginal seta situated far in front of middle, slightly removed from lateral margin, posterior marginal seta absent. Disk on either side in front of middle with a shallow, longitudinal groove. Surface impunctate, with finest traces of microreticulation only, glossy, somewhat iridescent.

Elytra (Figs 12, 19). Wide and short, convex, widest diameter in middle. Shoulders obtusely rounded off, lateral margin evenly curved. Basal margin strong, oblique, slightly sinuate, connected to scutellary striae. Striae except for sutural stria much abbreviated at shoulder, outer striae except for inner two also abbreviated at apex. Sutural stria fairly impressed, 2nd-4th striae slightly impressed, all very faintly crenulate, 5th stria not impressed, though distinct, consisting of a row of irregular punctures, 6th and 7th striae barely perceptible. Scutellary striae elongate, situated within 1st interval. Marginal channel narrow. 3rd interval with 2 setiferous punctures in centre of interval, anterior puncture in basal fourth, posterior puncture in middle, punctures rather inconspicuous. Near apex with two setiferous punctures outside 3rd stria in a deep, elongate striole marking the prolongation of 7th stria. Marginal pores inconspicuous. Intervals impunctate, with finest traces of microreticulation only that consist of extremely fine transverse lines. Surface highly glossy, rather iridescent. Inner wings absent.

Lower surface. Impunctate. Metepisternum slightly shorter than wide. Sternum VII in male 2-setose.

Legs. Without striking features. Three basal tarsomeres of male anterior tarsus expanded and squamose.

♂ genitalia (Fig. 10). Genital ring in the immature holotype weakly sclerotized, markedly asymmetric. Aedeagus moderately elongate, markedly curved, apex not twisted, foliaceous, strongly sclerotized, on right side less compressed, less laminate, and with a sclerotized rim. Orifice almost completely situated on right side. Internal sac with a band of many small sclerotized teeth and with some folding. Right paramere rather short and wide, at apex with two elongate apical setae and a shorter subapical seta, and with several thin and rather elongate hairs along lower margin. Left paramere elongate, basally moderately wide, with narrow, elongate, strongly curved apex that bears apparently only one very elongate apical seta.

♀ genitalia. Unknown.

Variation. Little variation noted, apart from minor difference in colour, because holotype is not fully coloured and yet light brownish.

Distribution (Fig. 21). Central Irian Jaya, known only from type locality.

Habits. Presumably collected by sieving leaf litter on the ground. This is perhaps a ground-living species that occurs in montane rain forest of median altitude.

Etymology. The name refers to the type locality, Jiwika.

11

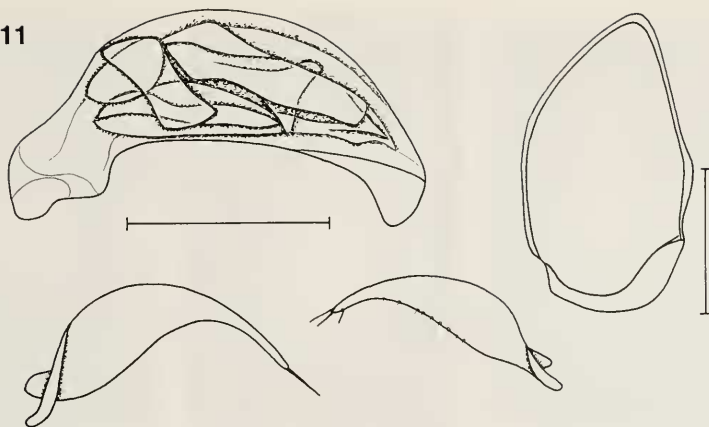


Fig. 11. *Mecyclothorax langdae*, sp. n. Aedeagus, parameres, and genital ring. Scales: 0.5 mm.

*Mecyclothorax langdae*, sp. n.

Figs 11, 13, 20, 21

Types. Holotype: ♂ (immat.), Irian Jaya, Jayawijaya-Pr., Langda, 2100-2300 m, 27.-28.8.1992, leg. A. RIEDEL (ZSM-CBM).

Diagnosis. Medium sized, reddish-piceous species (specimen perhaps not yet fully coloured), distinguished by absence of the posterior lateral seta of pronotum, slightly widened lateral margin at base, and obtuse basal angle of pronotum without distinct sinuosity, rather elongate elytra with rather impressed striae, and distinctly iridescent surface. It is closely related to *M. riedeli* BAEHR and *M. jiwikae*, sp. n., but is distinguished from both species by larger size, longer elytra, and light colour, further from *M. riedeli* by narrower base of pronotum with less marked basal angles, and from *M. jiwikae* by slightly better marked basal angles, bordered base, and distinct anterior sulcus of pronotum.

**Description:**

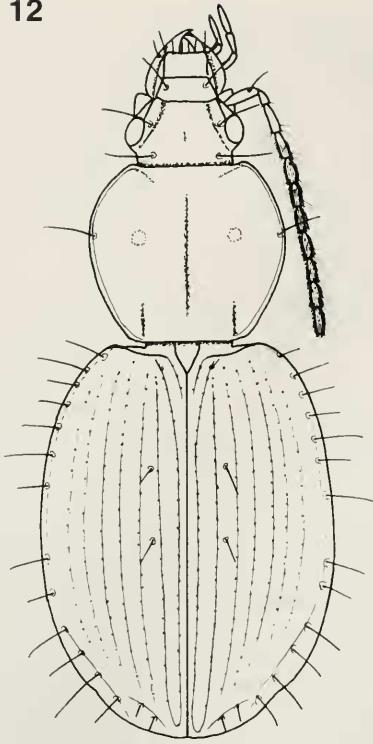
Measurements. Length: 4.6 mm; width: 1.85 mm; Ratios. Width head/prothorax: 0.65; width/length of prothorax: 1.17; width base/apex of prothorax: 1.05; width elytra/prothorax: 1.38; length/width of elytra: 1.52.

Colour. Head and pronotum reddish-piceous, elytra reddish, mouth parts, antennae, and legs reddish. Lower surface reddish.

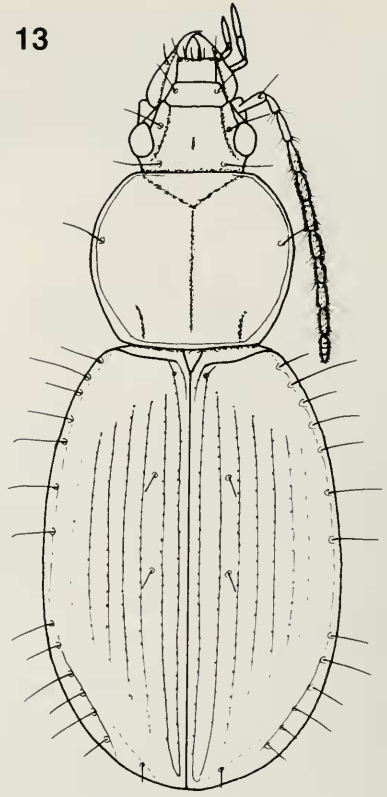
Head (Fig. 13). Rather narrow in relation to prothorax. Eyes moderately large, fairly protruding, orbits moderately large, oblique, slightly  $< \frac{1}{3}$  of length of eye. Clypeal suture well impressed. Frontal furrows slightly sinuate, very oblique, deep, prolonged almost behind posterior supraocular seta. Labrum transverse, truncate, 6-setose. Mandibles rather elongate, apically strongly curved. Mentum with distinct, apically rounded tooth. Antenna rather elongate, surpassing posterior border of pronotum by  $> 2$  antennomeres. Posterior supraorbital seta situated well behind posterior border of eye. Frons with shallow, elongate median groove. Surface impunctate, with traces of microreticulation only, glossy.

Pronotum (Fig. 13). Large, wide, circular, in middle rather depressed, laterally evenly curved, without any excision in front of the very obtuse basal angles. Widest diameter about in middle. Base slightly wider than apex. Apex faintly convex, apical angles slightly projecting, shortly rounded off. Base slightly convex, laterally not perceptibly oblique. Marginal channel narrow throughout, slightly widened in front of basal angles. Disk with a fairly deep, v-shaped anterior sulcus attaining anterior angles. Median line distinctly impressed, anteriorly meeting v-shaped sulcus, posteriorly much abbreviated. Basal grooves linear, elongate, slightly curved. Basal area not explanate, on same level with disk, impunctate. Apex unbordered, base distinctly bordered. Anterior marginal seta situated slightly in front of middle, slightly removed from lateral margin, posterior marginal seta absent. Disk on either side in front of middle with a very shallow, longitudinal groove. Surface impunctate, without microreticulation, highly glossy.

12



13



Figs 12, 13. Habitus. 12. *M. jiwikae*, sp. n. 13. *M. langdae*, sp. n. Lengths: 3.5 mm; 4.6 mm.

Elytra (Figs 13, 20). Rather elongate, convex, widest diameter in middle. Shoulders remarkably wide, almost evenly rounded off, lateral margin evenly curved. Basal margin strong, oblique, rather sinuate, connected to scutellary striole. Striae except sutural for stria slightly abbreviated at shoulder and at apex. 4 internal striae rather deeply impressed, faintly crenulate, 5th stria slightly impressed, consisting of a row of irregular punctures, 6th and 7th striae fine, though still perceptible. Scutellary striole elongate, situated within 1st interval. Marginal channel moderately narrow. 3rd interval with 2 setiferous punctures in centre of interval, anterior puncture slightly behind basal fourth, posterior puncture at middle, punctures fairly conspicuous. Very near to apex with a setiferous puncture at position of 3rd stria. Marginal pores moderately conspicuous. Intervals impunctate, with finest traces of microreticulation only that consist of extremely fine transverse lines. Surface highly glossy, rather iridescent. Inner wings absent.

Lower surface. Impunctate. Metepisternum about quadrate. Sternum VII in male 2-setose.

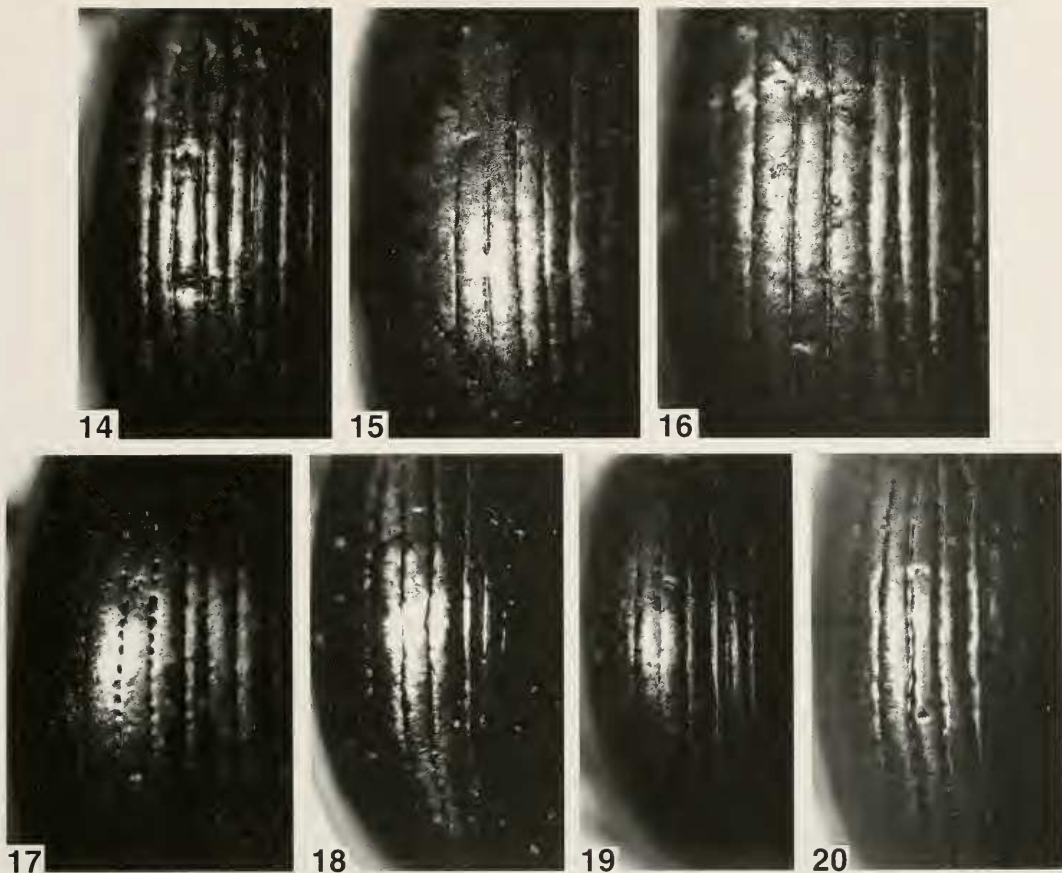
Legs. Without striking features. Three basal tarsomeres of male anterior tarsus expanded and squamose.

♂ genitalia (Fig. 11). Genital ring in the immature holotype weakly sclerotized, markedly asymmetric, with short apex. Aedeagus short and thick, remarkably curved, apex not twisted, foliaceous, rather sclerotized, on right side slightly less depressed. Orifice almost completely situated on right side. Internal sac complicately folded, though apparently without markedly sclerotized parts. Both parameres rather short and basally wide. Right paramere with short and rather wide apex, at apex with two elongate apical setae and a shorter subapical seta, and with several thin and rather elongate hairs along lower margin. Left paramere with short though narrow, strongly curved apex that bears apparently only one very elongate apical seta.

♀ genitalia. Unknown.

Variation. Unknown.

Distribution (Fig. 21). Eastern Central Irian Jaya. Known only from type locality.



Figs 14-20. Striation and microsculpture of median part of left elytron. 14. *Mecyclothorax julianae*, sp. n. 15. *M. eipomeki*, sp. n. 16. *M. eliti*, sp. n. 17. *M. sapei*, sp. n. 18. *M. riedeli* BAEHR. 19. *M. jiwikae*, sp. n. 20. *M. langdae*, sp. n. 35 × magnification.

Habits. Presumably collected by sieving leaf litter on the ground. This is perhaps a ground-living species that occurs in montane rain forest of median altitude.

Etymology. The name refers to the type locality, Langda.

#### Discussion

Together with the newly described species, 9 species of *Mecyclothorax* are now recorded from New Guinea. This is a rather low number compared with the known *Mecyclothorax* fauna of Hawaii and Tahiti, though it must be once more stressed that the fauna of New Guinea is yet extremely unsatisfactorily known. This is especially true for the fauna of the median and high altitudes that is known for its abundant endemism. A short view to the new species may illustrate the situation: in a rather limited area in eastern central Irian Jaya in median to high altitudes as many as 7 species are now known (see fig. 21) that, together with two species of very high altitudes, make up the whole known fauna of New Guinea. Were the rest of montane New Guinea at least as well collected as this area is, the number of resulting species would be perhaps three times as large or even more. But I am sure that even in the mentioned limited area in eastern central Irian Jaya several additional species will be found when collecting work is intensified.

It is interesting, on the other hand, that I failed to find anyone *Mecyclothorax* within the numerous

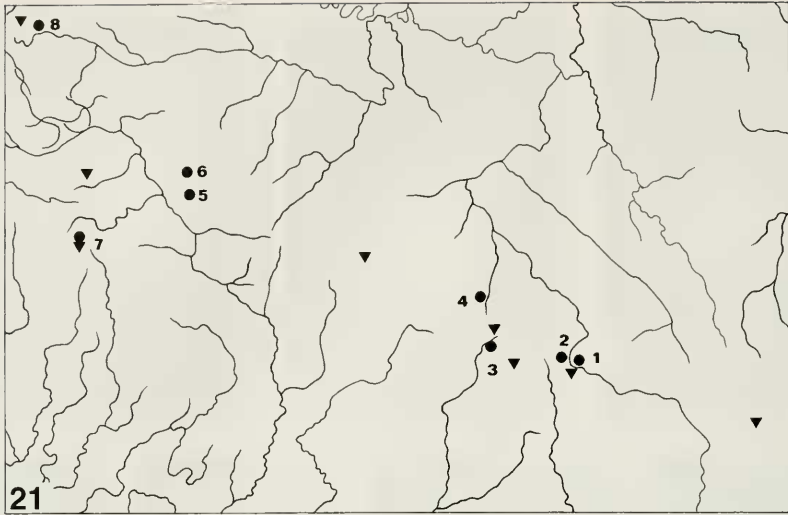


Fig. 21. Distribution of the *Mecyclothorax* species known from Irian Jaya. Eastern (right) margin of the map is the Papua New Guinea/Irian Jaya border, western (left) margin is situated slightly west of Gn. Trikora (Wilhelmina Top), upper (northern) margin is crossed in middle by the Idenburg River, lower (southern) margin meets at the right border about the former Papua/New Guinea border. Triangles denote the highest mountains. For position of cut within New Guinea see fig. 22. 1. *M. sapei*, sp. n.; 2. *M. juliana*, sp. n.; 3. *M. langdae*, sp. n.; 4. *M. eipomeki*, sp. n.; 5. *M. eliti*, sp. n.; 6. *M. jiwikae*, sp. n.; 7. *M. toxopei* DARLINGTON; 8. *M. riedeli* BAEHR. For the single extralimital species *M. sedlaceki* DARLINGTON see fig. 22.

carabid material (c. 3.000 specimens) that was collected by W. ULLRICH in Papua New Guinea during a two years collecting period. Most specimens of this sample were captured in lowland and mainly by light trapping. Therefore, in New Guinea *Mecyclothorax* is probably a strictly montane genus and apparently it requires specialized collecting methods, e.g. sieving, extraction with the WINKLER apparatus, or perhaps even beating from foliage. But these methods have been rarely carried out in New Guinea and the good collecting results of A. RIEDEL are perhaps due to his conducting of those methods.

As a conclusion, I guess that only a small part of the actual *Mecyclothorax* fauna of New Guinea is known and, even when the species at hand are very interesting from the standpoint of phylogenetic relations, it is probably premature to begin serious work on the relationships, evolution, and biogeographic history of the New Guinean *Mecyclothorax*. Nevertheless, I want to stress that even now some ideas to the phylogenetic relationships catch the eye:

Within the known New Guinean species *M. juliana*, sp. n. and perhaps also *M. sedlaceki* DARLINGTON are the most primitive species that externally look rather like a "normal" *Mecyclothorax*, and, apart from being already flightless and possessing a higher number of setiferous elytral punctures, they (especially *M. juliana*) are fairly similar to the more primitive Australian species related to *M. ambiguus* (ERICHSON). Both New Guinean species inhabit rather high altitude grasslands, as *M. juliana* has been found at 3.500 m, and *M. sedlaceki* at 4.250 m.

The rest of the species arrange into three groups: The first group is represented only by the unique *M. toxopei* DARLINGTON that differs from all other species by the additional setiferous punctures on 3rd and 5th intervals. *M. toxopei* is a high altitude grassland species, recorded thus far above 4.200 m only.

The second group includes species (*M. eipomeki*, sp. n., *M. eliti*, sp. n., *M. sapei*, sp. n.) that possess a strikingly cordiform pronotum with distinctly separated basal part and circular or ovalish basal grooves, and with non-iridescent elytra. This group includes species with and without basal pronotal seta. It seems that the presence or absence of this seta is rather accidental. The three species of this group known so far inhabit grasslands of rather high altitudes from 3.200 m to 3.500 m.

The third group (*M. riedeli* BAEHR, *M. jiwikae*, sp. n., *M. langdae*, sp. n.) includes species with an almost circular pronotum with feeble basal angles, linear basal grooves, and with non-separated basal part, and





Fig. 22. Distribution of *Mecyclothorax sedlaceki* DARLINGTON. The rectangle denotes the outline of the area enlarged in fig. 21.

they always lack the basal pronotal seta. In all species the elytra are distinctly iridescent. This may be the most evolved group within the New Guinean *Mecyclothorax*. All species of the third group have been thus far collected in rain forest in median altitudes between 1.900 m and 2.300 m.

Although the above grouping seems reasonable, at the present status of knowledge I do not want to go further in phylogenetic reasoning or even in analysis of the - certainly very interesting - biogeographic history. At any rate this analysis should await better knowledge of the Australian *Mecyclothorax*, in particular their phylogenetic relations and the biogeographic history of the rather aberrant species of North Queensland (MOORE 1984).

#### Acknowledgements

My thanks are due to Mr. A. RIEDEL, Friedberg, for kindly submitting the specimens for examination.

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